

CLAIMS

What Is Claimed Is:

1. A virtual image generation apparatus which generates within a virtually defined
5 virtual space virtual images of figures present in said virtual space as they would ^{be} observed
from a prescribed visual point while rendering said images show-through or non-show-
through, comprising:

virtual image generation means for rendering said non-show-through images into
show-through images when prescribed conditions have been fulfilled, and rendering show-
10 through images into non-show-through images when said prescribed conditions are no
longer fulfilled.

2. A virtual image generation apparatus which generates within a virtually defined
virtual space virtual images of subjects present in said virtual space as they would observed
from a prescribed visual point, comprising:

15 shape data memory means for storing shape data pertaining to physical objects
present in said virtual space;

position data specification means for specifying position data for said subjects;

20 overlap determination means for determining, on the basis of said shape data
stored in said shape data memory means and position data for said subjects specified by
said position data specification means, whether or not said physical object located between
said visual point and said subject should overlap and be visible from said visual point; and

25 image generation means for generating virtual images wherein said physical object
is processed by prescribed show-through processing in the event that said overlap
determination means has determined that said subject and said physical object are disposed
in a prescribed overlapping state, and for generating virtual images wherein said physical
object is processed by non-show-through processing and is not rendered show-through in
the event that said subject and said physical object are disposed in a state other than a
prescribed overlapping state.

3. A virtual image generation apparatus as defined in Claim 2, wherein said overlap

Subject
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determination means computes a first vector which extends in direction in which said subject is observed from said visual point, and a second vector which extends from said physical object towards said subject, computes the angle formed by this first vector and second vector, and, in the event that this angle falls within a prescribed relationship with regard to a prescribed reference angle, decides that an overlapping state exists, or, in the event that this angle falls outside the prescribed relationship, decides that a non-overlapping state exists.

4. A virtual image generation apparatus as defined in Claim 2, wherein said overlap determination means compares displacement from a prescribed ground point for a first reference point previously specified for said subject with displacement from a ground point for a second reference point previously specified for said physical object, and, in the event that the displacement for said first reference point is smaller than the displacement for said second reference point, decides that an overlapping state exists, or, in the event that the displacement for said first reference point is greater than the displacement for said second reference point, decides that a non-overlapping state exists.

5. A virtual image generation apparatus as defined in Claim 2, wherein said overlap determination means makes a determination that said overlapping state exists in the event that the angle defined in Claim 3 has the prescribed relationship to said reference angle, and that displacement for the first reference point as defined in Claim 4 is smaller than the displacement for the second reference point.

6. A virtual image generation apparatus as defined in Claim 2, wherein, for said show-through display, said image generation means generates a virtual image by displaying pixels for displaying said subject in accordance with a prescribed pattern, rather than pixels for displaying said physical object.

7. A virtual image generation apparatus as defined in Claim 6, wherein said pattern comprises an alternating sequence of pixels for displaying said physical object and pixels for displaying said subject.

8. A virtual image generation method which generates within a virtually defined virtual space virtual images of subjects present in said virtual space as they would observed

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from a prescribed visual point, comprising the steps of:

determining, on the basis of shape data relating to physical objects present in said virtual space and position data for said subjects, whether said physical object between said visual point and said subject overlaps when viewed from said visual point and, in the event
 5 that it is determined that said subject and said physical object are disposed in a prescribed overlapping state, generating a virtual image in which said physical object is processed by show-through processing or, in the event that said subject and said physical object are disposed in a state other than a prescribed overlapping state, generating a virtual image
 10 through non-show-through processing, in which said physical object is not rendered show-through.

9. A recording medium for recording program data for generating within a virtually defined virtual space virtual images of figures present in said virtual space as they would observed from a prescribed visual point, wherein said program data is for the process of determining, on the basis of shape data relating to physical objects present in said virtual
 15 space and position data for said subjects, whether said physical object between said visual point and said subject overlaps when viewed from said visual point and, in the event that it is determined that said subject and said physical object are disposed in a prescribed overlapping state, generating a virtual image in which said physical object is processed by show-through processing or, in the event that said subject and said physical object are
 20 disposed in a state other than a prescribed overlapping state, generating a virtual image through non-show-through processing, in which said physical object is not rendered show-through.

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